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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,303	03/19/2004	Hideaki Tsuda	3408.70081	7833

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EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/804,303	TSUDA ET AL.	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/19/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by the limitation of "terminal part rising from the liquid crystal layer contacting surface". The claims are rejected assuming that the hydrophobic terminal part with a straight chain-section having three or more carbon atoms of a compound inherently meets the limitation when the compound has been cross-linked in the presence of the liquid crystal to form the liquid crystal layer. Clarification is requested.

Claim Rejections - 35 USC § 103

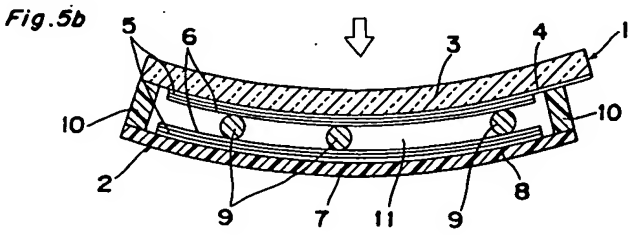
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 8, 10, 12, 14, 22, 24, 26, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakita (US 5,307,190) in view of Takiguchi (US 5,496,497).

Regarding claims 1, 3, 22, 24, Wakita teaches a liquid crystal panel (column 5, lines 66-68) having a liquid crystal layer (11, column 7, lines 16-17) sandwiched

between a pair of substrates (glass plate 3 and plastic resin film 7, column 7, lines 1-10), wherein the outer surface of at least one substrate is curved, and the liquid crystal layer contacting surface 6 is also curved, as shown in Fig. 5b, below.



Wakita fails to teach that the liquid crystal layer comprises a liquid crystal and a cross-linked resin, let alone that the cross-linked resin comprises a cross-linked structural part adhered to a liquid crystal layer contacting surface (adhered, cross-linked structural part) and a terminal part rising from the liquid crystal layer contacting surface (rising terminal part), or that the liquid crystal layer is formed by cross-linking, in the presence of a liquid crystal, a resin composition comprising one or more first compounds having a cross-linkable structural part, and a hydrophobic terminal part with a straight-chain section having three or more carbon atoms (hydrophobic, long-chain terminal part), or that the cross-linkable structural part comprises a polar-group structural part.

However, Takiguchi teaches a liquid crystal display device wherein the liquid crystal layer (column 1, lines 7-14) comprises a liquid crystal and a cross-linked resin (column 3, lines 44-54). Takiguchi teaches that the liquid crystal layer is formed by cross-linking, in the presence of a liquid crystal, a resin composition comprising one or more first compounds having a cross-linkable structural part (CH_2=CH-COO-, column 6,

lines 40-41), and a hydrophobic terminal part with a straight-chain section having eight carbons (-$(CH_2)_7CH_3$, column 6, line 42), which is within the claimed range of three or more carbon atoms (hydrophobic, long-chain terminal part), which, by Applicant's definition (original claim 22), constitutes a cross-linked structural part adhered to a liquid crystal layer contacting surface (adhered, cross-linked structural part) and a terminal part rising from the liquid crystal layer contacting surface (rising terminal part), after cross-linking the resin composition in the presence of the liquid crystal (column 3, lines 44-54). Takiguchi teaches that said cross-linkable structural part comprises a polar-group structural part (CH_2=CH-COO-, column 6, lines 40-41). Takiguchi teaches that the liquid crystal layer so prepared is used in the liquid crystal display device for the purpose of providing a liquid crystal display device that can be driven by a low voltage with high-speed response (column 21, lines 40-45).

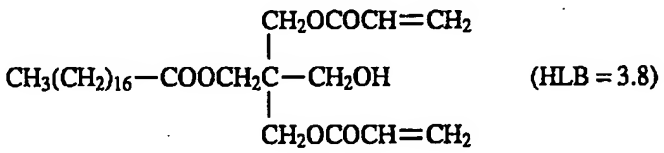
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the liquid crystal layer of Takiguchi, as the liquid crystal layer in the liquid crystal panel of Wakita, in order to obtain a liquid crystal display device which can be driven by low voltage with high speed response, as taught by Takiguchi.

Regarding claim 8, Wakita teaches that the thickness of plastic resin film substrate 7 is not more than 1/18 of the thickness of the glass plate substrate 3 (film thickness less than 0.3 mm, glass thickness greater than 0.55 mm, column 10, lines 24-25), which is within the claimed range of not more than ½.

Regarding claim 10, Wakita teaches that the thickness of at least one of said substrates is less than 300 μm (0.3 mm, column 10, lines 24-25), which is within the claimed range of from 100 to 500 μm.

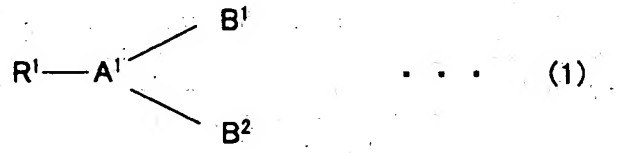
Regarding claims 12, 14, Wakita teaches that the material of one of said substrates is different from that of the other substrate, such that said substrates comprise a glass substrate and a plastic substrate (glass plate 3 and plastic resin film 7, column 7, lines 1-10).

Regarding claim 26, Wakita in view of Takiguchi has been discussed above. In addition, Takiguchi teaches that the resin composition comprises at least one compound represented by formula (17) shown below:



(HLB = 3.8) (17)

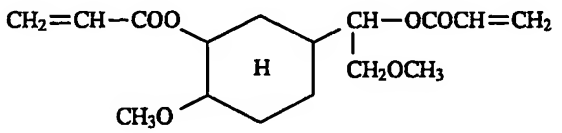
which corresponds to generic formula (1) of Applicant shown below:



. . . (1)

where $CH_3(CH_2)_{16}$ = R^1, the hydrophobic, long-chain terminal part; -$(COOCH_2)((CH_2)OH)C$ = A1, the trivalent group as defined by Applicant, comprising an aliphatic chain that may be branched, and $CH_2OCOCH=CH_2$ = B^1 = B^2, the cross-linkable structural parts.

Regarding claim 28, Wakita in view of Takiguchi has been discussed above. In addition, Takiguchi teaches that said one or more first compounds comprise a second compound represented by formula (18) shown below:



(18)

(HLB = 7.55)

with a cross-linkable structural part CH_2=CH- and substantially without a hydrophobic, long-chain terminal part.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakita in view of Takiguchi as applied to claims 1, 3, 8, 10, 12, 14, 22, 24, 26, 28 above, and further in view of Wachi (US 6,819,375).

Wakita in view of Takiguchi has been discussed above, and fails to teach a filter layer wherein the liquid crystal layer-contacting surface is the surface of the filter layer.

However, Wachi teaches a liquid crystal panel (column 1, lines 9-12) wherein the color filters transmit light of a particular wavelength and are liquid crystal layer-contacting surfaces (have surface profiles which define a state of alignment of the liquid crystal, column 2, lines 26-35). Wachi teaches that providing a filter layer wherein the liquid crystal layer-contacting surface is the surface of the filter layer, is for the purpose of eliminating problems caused by rubbing an alignment film, and of reducing production costs (column 3, lines 16-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a filter layer, wherein the liquid crystal layer-contacting surface is the surface of the filter layer, in place of the alignment layer

of Wakita in view of Takiguchi, in order to eliminate problems caused by a rubbed alignment film, and to reduce production costs, as taught by Wachi.

4. Claims 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakita in view of Takiguchi as applied to claims 1, 3, 8, 10, 12, 14, 22, 24, 26, 28 above, and further in view of Yamaguchi (US 6,801,286).

Wakita in view of Takiguchi has been discussed above, and fails to teach that the liquid crystal panel does not have an alignment control film, or that the liquid crystal tilts while the tilting direction is regulated by slits of an electrode or electrodes when voltage is applied.

However, Yamaguchi teaches that slits of an electrode can positively be used for the purpose of controlling the alignment, and hence the tilt of the liquid crystal (column 7, lines 34-41), in which case, there is no need for an alignment control film.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used slits in the electrodes, in place of the alignment control film of Wakita in view of Takiguchi, in order to control the alignment, and hence the tilt of the liquid crystal, as taught by Yamaguchi.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakita in view of Takiguchi as applied to claims 1, 3, 8, 10, 12, 14, 22, 24, 26, 28 above, and further in view of Lowe (US 6,055,031).

Wakita in view of Takiguchi has been discussed above, and fails to teach that the liquid crystal has negative dielectric anisotropy.

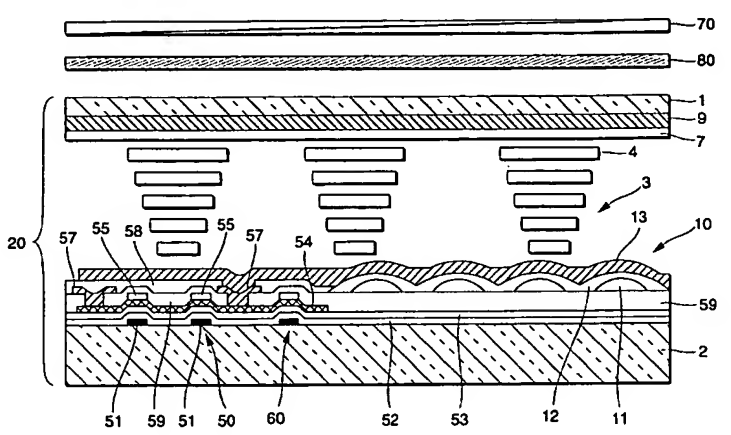
However, Lowe teaches that the advantage of liquid crystal with negative dielectric anisotropy over liquid crystal with positive anisotropy is that the negative anisotropy liquid crystal cell is normally white and maximum reflectivity is obtained at zero applied voltage, for the purpose of providing maximum display contrast ratio (column 6, lines 41-51) for the liquid crystal display (column 1, lines 12-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used liquid crystal with negative dielectric anisotropy as the liquid crystal of Wakita in view of Takiguchi, to provide a white cell and maximum reflectivity at zero applied voltage, in order to obtain maximum contrast ratio for the liquid crystal display, as taught by Lowe.

6. Claims 2, 6-7, 9, 17, 19, 23, 25, 27, 29, 37-38, 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka (US 6,266,111) in view of Takiguchi (US 5,496,497).

Regarding claims 2, 23, 25, 7, 40-41, Kataoka, in Fig. 5 shown on the next page, teaches a liquid crystal panel 20 (column 5, lines 45-30) having a liquid crystal layer 3 sandwiched between a pair of substrates (1, 2, column 5, lines 53-60), wherein said liquid crystal layer contacting surface is curved (13), and the thickness of one of said substrates (1, column 5, line 54) is not more than ½ of the thickness of the other substrate (2, line 56) as shown in Fig. 5 of Kataoka.

FIG.5



Kataoka fails to teach that the liquid crystal layer comprises a liquid crystal and a cross-linked resin, let alone that the cross-linked resin comprises a cross-linked structural part adhered to a liquid crystal layer contacting surface (adhered, cross-linked structural part) and a terminal part rising from the liquid crystal layer contacting surface (rising terminal part), or that the liquid crystal layer is formed by cross-linking, in the presence of a liquid crystal, a resin composition comprising one or more first compounds having a cross-linkable structural part, and a hydrophobic terminal part with a straight-chain section having three or more carbon atoms (hydrophobic, long-chain terminal part), or that the cross-linkable structural part comprises a polar-group structural part.

However, Takiguchi teaches a liquid crystal display device wherein the liquid crystal layer (column 1, lines 7-14) comprises a liquid crystal and a cross-linked resin (column 3, lines 44-54). Takiguchi teaches that the liquid crystal layer is formed by cross-linking, in the presence of a liquid crystal, a resin composition comprising one or more first compounds having a cross-linkable structural part (CH_2=CH-COO-, column 6,

lines 40-41), and a hydrophobic terminal part with a straight-chain section having eight carbons (-$(CH_2)_7CH_3$, column 6, line 42), which is within the claimed range of three or more carbon atoms (hydrophobic, long-chain terminal part), which, by Applicant's definition (original claims 23, 40), constitutes a cross-linked structural part adhered to a liquid crystal layer contacting surface (adhered, cross-linked structural part) and a terminal part rising from the liquid crystal layer contacting surface (rising terminal part), after cross-linking the resin composition in the presence of the liquid crystal (column 3, lines 44-54). Takiguchi teaches that said cross-linkable structural part comprises a polar-group structural part (CH_2=CH-COO-, column 6, lines 40-41). Takiguchi teaches that the liquid crystal layer so prepared is used in the liquid crystal display device for the purpose of providing a liquid crystal display device that can be driven by a low voltage with high-speed response (column 21, lines 40-45).

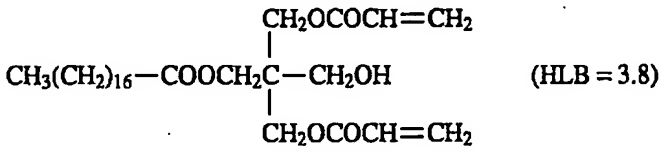
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the liquid crystal layer of Takiguchi, as the liquid crystal layer in the liquid crystal panel of Kataoka, in order to obtain a liquid crystal display device which can be driven by low voltage with high speed response, as taught by Takiguchi.

Regarding claim 6, Kataoka teaches that the curved surface of the liquid crystal layer contacting surface 13 is composed of a plurality of concavities and convexities, as shown in Fig. 5 on a prior page.

Regarding claim 9, Kataoka disclosed that the thickness of substrate 1 is not more than ½ of substrate 2, as shown in Fig. 5 on a prior page.

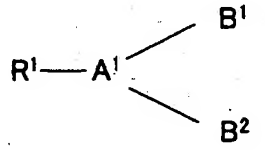
Regarding claims 17, 19, 37-38, Kataoka teaches one embodiment (Fig. 5 shown on a prior page) wherein the panel does not have an alignment control film. Thus the uneven parts of electrode layer 13, as shown in Fig. 5, regulate the tilting direction of the liquid crystal when voltage is applied.

Regarding claims 27, 42, Kataoka in view of Takiguchi has been discussed above. In addition, Takiguchi teaches that the resin composition comprises at least one compound represented by formula (17) shown below:



(HLB = 3.8) (17)

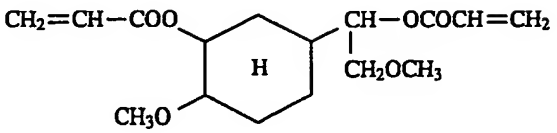
which corresponds to generic formula (1) of Applicant shown below:



. . . (1)

where $CH_3(CH_2)_{16}$ = R^1, the hydrophobic, long-chain terminal part; -$(COOCH_2)((CH_2)OH)C$ = A1, the trivalent group as defined by Applicant, comprising an aliphatic chain that may be branched, and $CH_2OCOCH=CH_2$ = B^1 = B^2, the cross-linkable structural parts.

Regarding claims 29, 43, Kataoka in view of Takiguchi has been discussed above. In addition, Takiguchi teaches that said one or more first compounds comprise a second compound represented by formula (18) shown below:



(18)

(HLB = 7.55)

with a cross-linkable structural part CH_2=CH- and substantially without a hydrophobic, long-chain terminal part.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka in view of Takiguchi as applied to claims 2, 6-7, 9, 17, 19, 23, 25, 27, 29, 37-38, 40-43 above, and further in view of Wachi (US 6,819,375).

Kataoka in view of Takiguchi has been discussed above, and fails to teach a filter layer wherein the liquid crystal layer-contacting surface is the surface of the filter layer.

However, Wachi teaches a liquid crystal panel (column 1, lines 9-12) wherein the color filters transmit light of a particular wavelength and are liquid crystal layer-contacting surfaces (have surface profiles which define a state of alignment of the liquid crystal, column 2, lines 26-35). Wachi teaches that providing a filter layer wherein the liquid crystal layer-contacting surface is the surface of the filter layer, is for the purpose of reducing production costs by eliminating the production of a separate member for defining the direction of alignment of the liquid crystal (column 3, lines 16-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a filter layer, wherein the liquid crystal layer-contacting surface is the surface of the filter layer, in the liquid crystal panel of Kataoka in view of Takiguchi, in order to provide color filtering, and simultaneously reduce production costs, as taught by Wachi.

8. Claims 11, 13, 15, 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka in view of Takiguchi as applied to claims 2, 6-7, 9, 17, 19, 23, 25, 27, 29, 37-38, 40-43 above, and further in view of Wakita (US 5,307,190).

Kataoka in view of Takiguchi has been discussed above, and teaches that the thickness of one of the substrates is not more than ½ of the thickness of the other substrate. Kataoka in view of Takiguchi fails to teach the value of the thickness of the substrates, or that the material of one of the substrates is different from that of the other substrate, let alone that they comprise a glass substrate and a plastic substrate.

However, Wakita teaches a liquid crystal panel (abstract) wherein the material of one of said substrates is different from that of the other substrate, such that said substrates comprise a glass substrate and a plastic substrate (glass plate 3 and plastic resin film 7, column 7, lines 1-10); whereby the thickness of plastic resin film substrate 7 is not more than 1/18 of the thickness of the glass plate substrate 3 (film thickness less than 0.3 mm, glass thickness greater than 0.55 mm, column 10, lines 24-25), which is within the claimed range of not more than ½. Wakita teaches that the thickness of at least one of said substrates is less than 300 μm (0.3 mm, column 10, lines 24-25), which is within the claimed range of from 100 to 500 μm. Wakita teaches that these specifications are for the purpose of providing a liquid crystal panel which can be bent (column 6, lines 50-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided substrates wherein one has a thickness within the claimed range of from 100 to 500 μm, and wherein the material of one of said

substrates is different from that of the other substrate, such that said substrates comprise a glass substrate and a plastic substrate, as the substrates of Kataoka in view of Takiguchi, in order to provide a liquid crystal panel which can be bent, as taught by Wakita.

9. Claims 21, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka in view of Takiguchi as applied to claims 2, 6-7, 9, 17, 19, 23, 25, 27, 29, 37-38, 40-43 above, and further in view of Lowe (US 6,055,031).

Kataoka in view of Takiguchi has been discussed above, and fails to teach that the liquid crystal has negative dielectric anisotropy.

However, Lowe teaches that the advantage of liquid crystal with negative dielectric anisotropy over liquid crystal with positive anisotropy is that the negative anisotropy liquid crystal cell is normally white and maximum reflectivity is obtained at zero applied voltage, for the purpose of providing maximum display contrast ratio (column 6, lines 41-51) for the liquid crystal display (column 1, lines 12-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used liquid crystal with negative dielectric anisotropy as the liquid crystal of Kataoka in view of Takiguchi, to provide a white cell and maximum reflectivity at zero applied voltage, in order to obtain maximum contrast ratio for the liquid crystal display, as taught by Lowe.

Allowable Subject Matter

10. Claims 30-33, 44-45 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The cited prior art of record fail to teach the specific second compounds in combination with the claimed specific first compounds.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

02/02/06

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

2/6/06